ENVIRONMENTAL ASSESSMENT
of the
Draft WILDLAND FIRE MANAGEMENT PLAN
for

Craters of the Moon National Monument

Idaho

PURPOSE AND NEED FOR ACTION

The National Park Service proposes to approve a Wildland Fire Management Plan for Craters of the Moon National Monument in Idaho. The National Park Service needs this plan to guide management decisions in response to wildland fire incidents occurring within Craters of the Moon National Monument. Specifically the plan is needed to outline the circumstances where wildland fires may be managed to achieve resource benefits by using options other than suppression. Without an approved fire management plan all wildland fires must be aggressively suppressed, even in those incidences where natural resources would actually benefit from fire.

The National Park Service has suppressed wildland fires within Craters of the Moon National Monument since its establishment as a national monument in 1924. Seventy-five years of fire suppression activities have altered normal ecological processes. As a result fire adapted plant communities have been changed. In turn, this creates a decline in the overall biological diversity of the area. The restoration of fire to park ecosystems is an important objective in managing the natural resources of Craters of the Moon National Monument. There is a need to ensure the perpetuation of park natural resources while managing wildland fire to protect of life, property and cultural resources.

The preparation of a Wildland Fire Management Plan is required by National Park Service (NPS) Director's Order #18 (DO-18) on Wildland Fire Management. DO-18 further defines the service wide goal of wildland fire management:

> Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities. The Environmental Assessment developed in support of the fire management plan will consider effects on air quality, water quality, health and safety, and natural and cultural resource management objectives.

The proposed wildland fire management plan for Craters of the Moon National Monument (CRMO) includes the following objectives:

1. Provide for firefighter and public safety. This is the first consideration and highest priority when implementing elements of the fire management plan (consistent with Director's Order #18-Fire Management).
2. Provide for continuation of the natural role of fire in the ecosystem consistent with the protection of life, property, cultural resources, and adjacent land values.
3. Evaluate and determine appropriate management action to be taken on all fire starts within 24 hours of discovery.
4. Monitor and manage all wildland fires until declared out.
5. Prevent all fires from burning onto adjacent lands unless there is an agreement with the managing agency to accept the fire.
6. Manage wildland fires, while providing for firefighter and public safety, protecting property, and complying with air quality laws and regulations per requirements of DO#18.

The 1992 CRMO General Management Plan identifies the following points:

Page 10: "The present practice of suppressing all wildland fires in the monument presents problems because much of the monument is inaccessible. Fire suppression costs are high relative to the benefit, since there is very little to burn in most places and the policy of total suppression does not conform to the modified suppression of the Bureau of Land Management (BLM) which manages adjacent lands."

The NPS must decide whether wildland fire management options other than full suppression are applicable and under what circumstances they are to be used, what rehabilitation techniques are appropriate following wildland fires, how to monitor short and long term effectiveness of the plan in meeting overall programmatic objectives.

Important issues include:

1. The effect of fire on native vegetation, in particular sagebrush steppe communities, including the loss of sage grouse habitat and the introduction or spread of exotic and/or noxious plants.
2. Safety of firefighters.
3. Impact of fire suppression operations on wilderness values.
4. Air Quality impacts, particularly visibility impairment, from smoke generated by wildland fires.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.10 Format

This section describes the alternatives considered, including the proposed action and a no action alternative. This section also summarizes the environmental consequences of the alternatives and defines the differences between the alternatives, especially in how their environmental impacts differ.

2.11 Alternative A (No Action) - Continue Full Suppression of All Wildland Fires

This alternative would continue the current policy of aggressive suppression of all wildland fires regardless of the potential benefits of fire to natural resources. This alternative would also preclude the use of prescribed fire to benefit resources or reduce hazard fuels. A Wildland Fire Management Plan describing this policy would be prepared, approved and implemented.

2.12 Alternative B (Preferred Action) - Fire Management Based on Resource Objectives

This alternative would establish three fire management Units (as outlined in the draft Wildland Fire Management Plan) in which different fire management strategies would apply.

Fire management Unit I includes all areas of the monument north of US Highway 20 and that portion of the monument surrounding the headquarters/campground complex south of the highway (91 acres). Unit I consists of approximately 5,000 acres, including the 2,380 acre Watershed Protection Subzone (CRMO General management Plan, 1992). Wildland fires in Unit I would be managed using active suppression strategies intended to minimize area burned. Active suppression efforts are considered necessary in this area due to continuous fuels, steep slopes, the presence of administrative facilities, and the absence of fuel breaks to prevent fire spread outside of the monument.

Fire management Unit II encompasses the area (approximately 5,000 acres) between U.S. Highway 20 and the wilderness boundary, excluding the headquarters/campground complex which is part of Unit I. Included within Unit II is the seven mile scenic loop road, interpretive wayside exhibits, three comfort station structures, a remote weather station and most of the monument's trails. Wildland fires in Unit II would be managed using modified suppression strategies. These strategies include the use of existing natural (lava flows and cinder fields with very sparse vegetation) and man-made fuel breaks such as roads and trails. All areas within this Unit with vegetation capable of carrying a fire are within one mile of a road.

Fire Management Unit III includes the Craters of the Moon National Wilderness Area (43,243 acres) and the 660 foot strip between the monument and wilderness boundaries. Within this zone most areas with vegetation sufficient to carry a fire occur along the Great Rift. These areas are surrounded by extensive lava flows which impedes fire spread. Fuels are sufficient in several areas for fires to spread north of the wilderness boundary and a short distance into Fire Management Unit II. These areas are in the vicinity of the Tree Molds parking area and Half Cone. Sparsely scattered stands of limber pine occur along the monument's west boundary. Under certain conditions it would be conceivable for fire to spread onto USDI Bureau of Land Management (BLM) lands adjacent to the monument. However, the fuels on adjacent BLM lands are also contained by barren lava flows.

Management of the wilderness area is directed by the provisions of the Wilderness Act of 1964 and guided by NPS Director's Order #41. The Act specifically prohibits roads, structures, and the use of mechanized transportation. Exceptions for the use of mechanized transport may only be made when the activity and tool represents the minimum requirement to manage the area as wilderness as outlined in DO #41.

Wildland fires within Fire management Unit III would not require initiation of active suppression efforts but would trigger continuous monitoring. Decisions to continue monitoring or initiate suppression would be based upon development of a Wildland Fire Implementation Plan which requires periodic reassessment whether the fire is meeting resource goals or whether external factors, such as air quality or lack of staff resources, require changing to a suppression response. This decision making process evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives as selection criteria. Suppression efforts would be undertaken to prevent fires from spreading outside of the monument unless a prior agreement to accept the fire was made with BLM.

2.20 Alternative Considered but Eliminated from Detailed Study

Utilize Prescribed Fire to Achieve Resource Objectives

This alternative was considered but eliminated due to an incomplete understanding of specific resource benefits to be derived from prescribed fire. Further analysis of resource conditions and the role of fire may indicate a beneficial role for prescribed fire within the monument. This would most likely apply to vegetative communities in Fire Management Unit I where full suppression is to be continued. In such a case, an amendment to the FMP and a supplemental environmental analysis would be prepared before initiating a prescribed fire program.

2.30 Comparison of the Alternatives/ Issues

This plan covers only unplanned ignitions of natural or man-made origin. A comparison of the two alternatives is difficult to quantify since the results depend upon when and where unplanned fires occur. Wildland fires will occur and will burn lands within the monument regardless of which alternative is applied. The length of time a fire burns does not directly correlate to the amount of area burned.

Consequences	Alternative A (No Action)	Alternative B (Proposed Action)
Restore Role of Fire in Native Plant Communities	The role of fire as a natural process would be limited by active suppression efforts to limit burned areas.	The role of fire as a natural process would be resumed.
Introduction and Spread of Noxious Weeds	The potential for noxious weeds to colonize areas disturbed by fire could be reduced if the total burned area were minimized by active suppression actions. On the other hand, fire suppression	The total area of short-term disturbance following fire would be greater in Fire Management Units II and III compared to Alternative A, if fires are not immediately suppressed. However, the

Consequences	Alternative A (No Action)	Alternative B (Proposed Action)
	operations could inadvertently bring in weed seeds on firefighting equipment.	current scarcity of noxious weeds in these units would reduce the potential of new infestations compared to areas with established noxious weed populations.
Firefighter Safety	Risks to firefighters would remain high during fire suppression operations in remote and difficult to access parts of the monument.	Risks to firefighters would be reduced in Fire Management Units II and III through modified suppression tactics or simply not having to respond and suppress fires in remote areas when the fire in question is securely contained by natural fire breaks and poses no risk to natural resources or property.
Wilderness Values	The role of fire as a natural process would be limited by active suppression efforts. Fire suppression operations would create short term impairment of wilderness solitude (aircraft, firefighters) and leave long term physical scars (fire-lines, retardant drops). Human intervention in suppressing fires would diminish wilderness qualities.	The role of fire as a natural process would be resumed. The short and long term impacts of fire suppression operations within wilderness would be minimized if fires were not actively suppressed in Fire Management Unit III (the wilderness area).
Air Quality	Smoke generated by wildland fires and the resulting impairment of visibility would be minimized by extinguishing fires as soon as possible.	Smoke generated by wildland fires and the resulting impairment of visibility could increase or be spread over a longer period of time if fires burning in Fire Management Unit III are not immediately suppressed.

Affected Environment

This section of the environmental assessment describes the existing environment potentially affected by the proposed action. An analysis of how the proposed action might effect these resources is found in Section IV.

3.10 Introduction

The 21,398 ha (53,495 acre) Craters of the Moon National Monument was established in 1924 to protect a unique area of volcanic cones, craters, lava flows and lava tube caves located on the Great Rift of the Snake River Plain in south central Idaho. The monument's north end includes the foothills of the Pioneer Mountains. Elevations range from 1625 meters (4880 ft) to 2355 meters (7730 ft). Most land-forms within the monument are derived from basaltic lava and cinders resulting from a series of eight major volcanic eruptions which have occurred over the past 15,000 years.

Over half of the monument consists of recent lava flows relatively devoid of vegetation. The vegetated areas are dominated by sagebrush communities intermixed in may areas with limber pine. Stands of Douglas-fir occur on north facing slopes of older cinder cones and in the foothills of the Pioneer Mountains. Many of the vegetated areas are separated from surrounding areas on the Snake River Plain by barren lava flows up to five km wide. These flows make access to many areas of the monument very difficult but confine the spread of most wildland fires.

3.20 Status of Adjacent Lands

The monument is mostly surrounded by public lands administered by the Bureau of Land Management (BLM). BLM lands surrounding the monument are administered the Upper Snake River District with field offices in Shoshone and Idaho Falls. Most BLM lands adjacent to the monument boundary are relatively barren lava flows preventing the spread of fire into or out of the monument. The majority of these lands south of Highway 93, 20/26 are part of the Great Rift Wilderness Study Area proposed for wilderness designation by BLM in 1980.

A four mile long corridor (94.2 acres) surrounding Highway 93, 20/26 extending across the north end of the monument was excluded from the monument in 1941 and is owned by the state of Idaho Highway Department.

The Department of Energy's 840,000 acre Idaho National Engineering and Environmental Laboratory lies 12 mile east of the monument.

The nearest private lands lay less than one half mile from the monument boundary on the north end.

3.30 Air Resources

The wilderness area within the monument is a designated Class I area under the Clean Air Act. Class I designation mandates the most protective requirements for protection of air quality related values (AQRV) from adverse impacts of air pollutants.

Air quality is of critical importance to visitor enjoyment, human health, scenic vistas, and preservation of natural systems. Many elements of the environment are sensitive to air pollution. These elements, including vegetation, visibility, water quality, wildlife, historic and prehistoric objects and structures, are referred to as air quality related values (AQRV). Designated AQRVs are visibility, scenery, human health, and vegetation.

Monitoring programs instituted at the monument measure different parameters of air quality including visibility, particulates, ozone, weather, and acid deposition. While the Craters of the Moon area

remains one of the least polluted air regions in the United States, it has deteriorated over the past several decades.

3.40 Water Resources

Surface water is scarce within the monument. The only perennial streams are located on the North End of the monument. The larger of the two, Little Cottonwood Creek, has four springs from which the monument's drinking water is obtained. Water is diverted at the springs into a pipeline extending to an underground storage tank just north of the headquarters complex. The discharge of these streams peaks at just over one cubic feet per second (Falter et al. 1996). Other surface water within the monument includes ice from accumulated snow within some of the lava tubes and lava sinks. The monument recently completed a baseline inventory of its water resources.

3.50 Soils

Soil surveys of surrounding areas indicate that monument soils are primarily wind blown loess or soils that have developed from the basaltic lava. Soils in the North End differ from the those associated with the lava flows in both origin and deposition. In general these soils are better developed than those in the rest of the monument. Little time has been available for soil development in those areas of the monument covered by recent lava flows. Soil accumulation depends on the deposition of wind blown loess in cracks and crevices.

3.60 Vegetation

The monument supports a surprising diversity of plant communities. There are twenty-six different vegetation types within Craters of the Moon (Day and Wright 1985). More than 22% of the monument's total area is covered by shrubs, mostly sagebrush and antelope bitterbrush, and grasses or a combination of both. This type of vegetation community is referred to as shrub steppe.

The vegetation associated with the different geologic areas of the monument are as follows: recent lava flows can be divided into two types, low density and medium density flows. Low density flows are found in about 58% of the total area of the monument. Medium density flows cover 10% of the total monument area. The species composition is similar, and consists primarily of forbs such as Penstemon (Penstemon deutus), buckwheat (Eriogonum umbellatum), desert parsley (Cymopterus terebinthinus), skeletonweed (Stephanomeria tenuifolia), and cinquefoil (Potentilla glandulosa).

Cinder cones support three different plant communities, depending on the aspect and successional stage. The cinder gardens, which cover 2% of the monument, comprise a distinct vegetational type characterized by dwarf buckwheat (Eriogonom ovalifolium var. depressum), scorpionweed (Phacelia hastata), Cryptantha (Cryptantha interrupta), hoary aster (Aster canenscens), dusty maiden (Chaenactis douglasii), skeletonweed (Stephanomeria tenuifolia), and dwarf monkeyflower (Mimulus nanus). As soils develop on the cinder, antelope bitterbrush (Purshsia tridentata) dominates shrub communities. Limber pine (Pinus flexilis) are present on north-facing slopes where sufficient moisture is available. Limber pine occurs as a codominant species with antelope bitterbrush in the three cinder cone vegetation types, which together is 7% of the monument's total area.

The North End contains three vegetation types that are notable for the diversity they contribute to the monument: Douglas fir/ mountain snowberry, upland quaking aspen, and riparian. The three types cover only .3% of the monument's total area, but provide important wildlife habitat. The Douglas fir/mountain snowberry type is found on relatively steep north-facing slopes of older cinder cones and along Little Cottonwood Creek. The upland quaking aspen type occurs on upland sites away from permanent water courses. The riparian type is characterized by dense woody vegetation, proximity to a permanent water course, and a dense layer of tall forbs.

Table 1

Vegetation type	Area Acres	Area Hectares	Percent of Total
Cinder Gardens	**1195**	**484**	**2.2**
Low Density Lava	**30948**	**12525**	**57.8**
High Density Lava	**5430**	**2196**	**10.1**
Mountain Big Sagebrush/Bluebunch Wheatgrass	**2772**	**1122**	**5.2**
Mountain Big Sagebrush/Sandberg Bluegrass	**6245**	**2527**	**11.7**
Mountain Big Sagebrush/Needle Grass	**778**	**315**	**1.5**
Mtn. Big Sagebrush/Needle-and-thread/Cheatgrass	**5**	**2**	**<0.01**
Mountain Big Sagebrush/Idaho Fescue	**242**	**98**	**0.5**
Big Sagebrush/Cheatgrass	**18**	**7**	**<0.01**
Mtn. Big Sage/Bluebunch Wheatgrass/Idaho Fescue	**13**	**5**	**<0.01**
Three-tip Sagebrush/Idaho Fescue	**101**	**41**	**0.2**
Early Low Sagebrush/Idaho Fescue	**1**	**0.4**	**<0.01**
Low Sagebrush/Sandberg Bluegrass	**311**	**126**	**0.6**
Low Sagebrush/ Idaho Fescue	**63**	**26**	**0.1**
Low Sagebrush/Sandberg Bluegrass/Idaho Fescue	**38**	**15**	**0.07**
Antelope Bitterbrush	**1178**	**477**	**2.2**
Antelope Bitterbrush/Great Basin Wild Rye	**211**	**85**	**0.4**
Bluebunch Wheatgrass/Idaho Fescue	**1**	**0.4**	**<0.01**
Bluebunch Wheatgrass/Sandberg Bluegrass	**24**	**10**	**0.04**
Great Basin Wild Rye	**21**	**9**	**0.03**
Limber Pine/Antelope Bitterbrush (Low total cover)	**558**	**226**	**1.1**
Limber Pine/Antelope Bitterbrush (High total cover)	**2995**	**1212**	**5.6**
Limber Pine/Antelope Bitterbrush (High density pine)	**214**	**87**	**0.4**
Douglas-fir/Mountain Snowberry	**72**	**29**	**0.1**
Upland Quaking Aspen	**38**	**15**	**0.07**
Riparian	**73**	**30**	**0.13**
Total	**53545**	**21670**	**100**

Noxious and exotic weeds are scare in the relatively pristine vegetative communities found in Fire Management Units II and III. A combination of past disturbance (mining) and better soils has resulted in established populations of Canada thistle, bull thistle, and mullein in Fire Management Unit I. A large volume of heavy trucks haul hay through the monument on highway 93, 20/26 producing a continued seed source for noxious weeds such as spotted knapweed.

3.70 Fauna

A total of 162 bird and 49 mammal species have been reported within the monument. Mule deer, are common within the monument except in winter. Black bear, elk, and pronghorn antelope and mountain lions are regular visitors to the north end of the monument but are uncommon south of the state highway. More than 2000 species of insects have been identified within the monument (Horning and Barr 1970). There are no fish species, and just two amphibians, the western toad and boreal chorus frog recorded within the monument. Eight reptile species have been reported: sagebrush lizard, short-horned lizard, western skink, rubber boa, racer, Great Basin gopher snake, western garter snake, and western rattlesnake.

Three subspecies of small mammals are endemic to the monument and the Snake River Plain. They are subspecies of the great Basin pocket mouse, the pika and the yellow-pine chipmunk. These subspecies are characterized by their darker fur, which would appear to be an adaptation to the black lava rock.

There are no federally designated threatened or endangered species residing within the monument. Bald eagles are a transient species that pass through during migration. There are two former candidate species

that reside in the monument; the Townsend's big-eared bat and the blind cave leiodid beetle. One other former candidate species has been reported in the monument; the ferruginous hawk. The State of Idaho has designated species of special concern and three of these species have been reported in the monument; the ferruginous hawk, kit fox and merlin.

3.80 Cultural Resources

The nature of the terrain within Craters of the Moon National Monument has never encouraged human occupation and settlement. In spite of that the artifacts of past human use are found scattered throughout the monument. For the most part prehistoric artifacts are limited to quarry and chipping sites and hunting blinds or route markers constructed of native rock. Historic resources include the highly modified Oregon Trail route known as Goodale's Cutoff, mining scars, and indications of pre-monument grazing (a primitive concrete watering trough). Remnants of the early NPS administration of the monument are also limited; modern structures have replaced all but two of the structures which had existed before the 1950s (Louter 1992).

A 1966 archaeological reconnaissance identified twenty-eight pre-historic sites within the monument and three adjacent to the boundary (Sneed 1967). Seventeen are open camp or chipping sites; five are cave sites; three are rock structure sites; two hunting blind sites; and three quarry sites. On a site visit in 1991 associated with compliance clearance for two trails, a University of Idaho archeologist identified three additional quarry sites.

In 1992 and 1993 with the assistance of the Idaho State University Archeology Department, two surveys of 2000 acres each were undertaken at the monument (Sammons and McLaughlin 1992 and Sammons 1993). A total of seven new sites were documented. Additionally, the 28 sites documented in 1966 were re-visited. Also, during a compliance clearance for the rehabilitation of the scenic loop drive, one new site was documented, and during compliance clearance for the north boundary fence line, two new sites were documented.

3.9 Social and Economic Values

The monument hosts 200,000 to 250,000 visitors a year. In 1989 a visitor survey (USDI 1989) was completed in which visitors were asked to rank the importance of the monument's natural resources. Resources that were rated extremely important by a predominance of visitors were rock formations, scenic views, wildlife, and air quality. This would indicate that visitors place a high value on the monument's resources.

IV.ENVIRONMENTAL CONSEQUENCES

This section is the scientific and analytic basis for comparison of the alternatives described in Section II. It describes the probable consequences of each alternative on selected environmental resources. The discussion is organized by alternatives.

4.10 Alternative A (No Action) - Continue Full Suppression of All Wildland Fires

4.11 Vegetation

The effects of this alternative on vegetation would continue as they have for the past 75 years of active fire suppression throughout the monument. The primary impact is the partial loss of fire's dynamic influence of reshaping the otherwise static nature of these communities. For example, in the sagebrush steppe community, sagebrush becomes the dominant species and while grasses and other herbaceous cover

declines. This results in a less species diverse vegetative community, generally less valuable as a habitat for wildlife overall. Periodic fires create a diverse mix of areas dominated by grasses and forbs as well as different aged stands of sagebrush and other shrubs. Another impact of continued fire suppression is the expansion of certain plant communities beyond their current range. Aspen and Douglas Fir trees would likely expand into sagebrush steppe areas when not influenced by periodic fires.

Fire has long been an important influence shaping plant communities of the Snake River Plain. The frequency with which a given area burned was dependent on the frequency of ignitions, the plant community types, topography and regional climate. Fire as a physical process has several ecological functions:

1. maintenance of plant vigor and productivity;
2. reduction of woody fuel accumulations;
3. maintenance or creation of early successional stages;
4. an increase in plant community diversity;
5. an increase in forage availability and nutritional quality.

Native plant species have adapted many different strategies to survive fire in this ecosystem. Some, such as the rabbitbrushes, resprout, after a fire while others such as big sagebrush must reestablish by seed following a fire. Rhizomatous grasses such as western wheatgrass and shrubs, which are capable of resprouting from lateral roots may increase in dominance in communities following fire. Other species are adapted to take advantage of reduced post-fire competition. Seeds may be stored in the soil for long periods and only germinate following a fire or seeds carried to the burned area find more favorable conditions for germination. Since fire usually sets back succession and creates openings, burned areas have a potential for noxious weed invasion is a seed source is available.

Actual post-fire plant community succession is dependent upon four primary factors including:

1. pre-fire plant community species composition;
2. fire intensity and its effect on the existing plant community;
3. post-fire environmental conditions including precipitation;
4. the availability of seeds, rhizomes or other propagules to revegetate burned areas.

To varying degrees three of these factors occur at random, resulting in post-fire succession following differing pathways. General predictions can be made based upon average conditions but variations can also be expected as a result of random events.

Response of Major Plant Communities to Fire

The plant communities of CRMO are diverse and range from recent lava flows with pioneer species taking hold in cracks and crevices to well developed stands of Douglas-fir and quaking aspen. Twenty-six distinct plant community types are described within the monument (Day and Wright 1985). Twenty of these have the potential to sustain fires (Wright 1989). These twenty have been simplified into nine types for fire management purposes.

Mountain Big Sagebrush (MBS) - MBS, in combination with several species of grasses which dominate the understory, is the most widespread of all vegetation types found within the monument. Of the sagebrush species, MBS is one of the best adapted to reoccupy burned areas. MBS establishes readily following fire. Its seeds germinate more readily following a heat treatment than if untreated (Chaplin and Winward 1982). The plants grow rapidly and reach reproductive maturity in within 3-5 years. MBS may return to preburn levels within 15 to 20 years if seedlings successfully establish the first year. If not, it may require 30 to 50 years for sagebrush to fully occupy a burned site (Blaisdell et al. 1982).

Herbaceous productivity normally increases following fire in MBS (Harnis and Murray 1973, Uresk et al. 1980, Tisdale and Hironaka 1981, Johnson and Strang 1983, and Blaisdell et al. 1982). Most perennial grass species are well adapted to fire. Herbaceous productivity will remain at higher levels until shrubs re-establish on the site. Initially forbs will dominate following fire (Kuntz 1982). Perennial grasses will gradually increase and dominate. At lower elevations and on more xeric sites, annual grasses such as cheat

grass may initially dominate if post-fire coverage of perennial is low. This could occur in sagebrush communities on cinder derived soils because these soils are more xeric than most soils. There are few native annual grasses common to this type, however, annual forbs may also increase greatly during the initial post-fire years until perennials dominate the site.

If MBS communities are not burned periodically, sagebrush cover will continue to increase in density and cover. Potential cover of MBS may exceed 40% (Bunting et al. 1987). Increasing sagebrush cover will suppress the herbaceous productivity in the understory. Forbs, in particular, will be diminished. The severity of fires increases with the density and mass of sagebrush to a point at which herbaceous recovery is seriously reduced. Diversity of the community is greatest within a few years of a fire and gradually declines as the sagebrush stand matures.

Antelope bitterbrush is common within the MBS community and may be greatly reduced in density by fire. Bitterbrush density following fire is reduced by 50% on average but wide variation has been observed (Bunting et al. 1985). Observations of bitterbrush establishment on burned sites within the monument suggest bitterbrush recovers faster than sagebrush.

Three-tip Sagebrush (TTS) - TTS vegetation types occur primarily on Carey Kipuka and on areas north of the highway. TTS has been reported to sprout following fire (Pechanec et al. 1965, Morris et al. 1976) but may vary among ecotypes. Without periodic fire, TTS will gradually increase in density and cover. It appears that the maximum coverage for the species is 25 to 30% (Bunting et al. 1987). As TTS cover increases herbaceous cover will generally decrease.

Low Sagebrush - Within CRMO low sagebrush occurs exclusively north of the highway, typically on ridge-tops on either side of Little Cottonwood Canyon. Due to low productivity, these site are difficult to burn and may act as a natural fire break. Low sagebrush does not resprout and is easily killed by fire. Even in the absence of fire, low sagebrush cover does not tend to increase beyond 13% cover at CRMO.

Antelope Bitterbrush - Antelope bitterbrush rapidly occupies sites following disturbance. Populations of bitterbrush associated with mountain big sagebrush are reasonably well adapted to periodic fire (Bunting et al. 1985). Bitterbrush regenerates after fire either by sprouting or from off-site seed cached by rodents(Nord 1965). Sprouting is generally more successful in plants with a decumbent growth form. These decumbent plants sprout from a mass of buds at ground level at the base of the main plants or from subsidiary bud masses formed where branches touch the ground and layer. Resprouting of bitterbrush averaged 45% in nonforested communities where mountain big sagebrush was present. Even though bitterbrush is often killed outright by fire, it often occurs in communities with a high fire frequency. Fire may be necessary to maintain populations of bitterbrush by removing competing vegetation and baring mineral soil, which favors rodent seed caching. Bitterbrush plants in juniper woodlands of Idaho and Montana are highly sensitive to fire, yet their long-term survival appears to depend on seral, fire-generated conditions (Bunting et al. 1985).

Limber Pine/bitterbrush - The thin bark of young limber pine trees does not protect them from even cool fires. Since the bark at the base of older trees is often 2 inches (5 cm) thick, these trees can withstand stem scorch from low severity fires. Terminal buds are protected somewhat from the heat associated with crown scorch by the tight clusters of needles around them.

The vulnerability of limber pine to fire is reduced by the open structure of its stands and the dry, exposed habitats with sparse undergrowth in which it grows. Fires are infrequent and often of low

intensity with negligible spread. Fire intervals range from 50 to 200 years in Montana (Alexander et al 1986). Fuel loads from downed and dead materials are usually low. Hazardous fuel conditions are usually the result of dead herbaceous fuels (Fischer and Clayton 1983, Pfister et al. 1977, Youngblood and Mauk 1985). High cover limber pine/bitterbrush stands tend to occur in association with cinder and older pahoehoe lava flows on many areas south of the highway. Selected areas in the central and southern portions of the monument (usually on the northeast slopes of cinder cones) support densities of limber pine as high as 456 trees per hectare. Post-fire regeneration of limber pine is a consequence of seed caching by Clark's nutcrackers (Lanner and Vander Wall 1980).

Douglas Fir - Fire suppression has resulted in long fire-free periods which have allowed Douglas-fire regeneration to become well-established. This community type is found in three distinct areas of CRMO, the northern slopes of Grassy and Sunset Cones and in the upper portions of Little Cottonwood Canyon. Photographic comparisons indicate Douglas fir stands have increased in density and in area, spreading into adjacent sagebrush areas over the past 50 to 75 years. The primary cause of the regional increase in Douglas fir is thought to be fire suppression (Houston 1973 and Arno 1980). Fire in this type would reduce the density of Douglas fir and increase the density of shade intolerant shrubs such as sagebrush and bitterbrush. Low intensity fires would primarily effect the young trees leaving mature trees as a seed source for regeneration. High intensity fires could potentially kill most Douglas fir within the stand and require several hundred years to replace completely.

Mature trees can survive moderately severe ground fires because the lower bole is covered by thick, corky bark that insulates the cambium from heat damage (A. D. Revill Associates. 1978 and Fischer and Bradley 1987). It takes about 40 years for trees to develop fire-resistant bark on moist sites in the northern Rockies (Fischer and Bradley 1987). Protection offered by thick bark is often offset by low growing branches and flammable foliage that make trees susceptible to crowning (Fischer and Bradley 1987 and Lotan et al. 1981).

Douglas-fir relies on wind-dispersed seeds to colonize burned areas where trees have been killed. Mineral soil exposed by burning provides a good seedbed. Germination of artificially sown seed was about 60 percent on burned seedbeds but only 10 percent on unburned duff (Boyce and Neuenschwander 1989). Seedling establishment begins a few years after fire and is restricted to within a few hundred yards of seed trees.

Upland Quaking Aspen - In the absence of fire, aspen will tend to spread into adjacent sagebrush communities (Loope and Gruell 1973). Older aspen stands will in turn be invaded by Douglas fir if a seed source is available. Fire in aspen stands tend to regenerate the stand by inducing resprouting of aspen and controlling competing Douglas fir seedlings and saplings. Many aspen stands will deteriorate over time if not invigorated by fire and revert to grass or sagebrush (Krebill 1972, Schier 1975, DeByle 1976, DeByle and Winokur 1985).

Small-diameter quaking aspen is usually top-killed by low-severity surface fire (Jones and DeByle 1985). Brown and DeByle (1987) found that as dbh increases beyond 6 inches (15 cm), quaking aspen becomes increasingly resistant to fire mortality. Large quaking aspen may survive low-severity surface fire, but usually shows fire damage (Brown and DeByle 1987 and Kovalchik 1987). Moderate-severity surface fire top-kills most quaking aspen, although large-stemmed trees may survive. Some charred stems that survived low- or moderate-severity fire initially have been observed to die within 3 or 4 postfire years. Severe fire top-kills quaking aspen of all size classes.

Moderate-severity fire does not damage quaking aspen roots insulated by soil. Severe fire may kill roots near the soil surface or damage meristematic tissue on shallow roots so that they cannot sprout. Deeper roots are not damaged by severe fire and retain the ability to sucker (Gruell and Loope 1974, Tucker and Jarvis 1967 Schier and Campbell 1978, Schier et al. 1985).

Summary of Fire Effects to Vegetation- Even with the full suppression effort policy of the first seventy-five years of CRMO, lightning and human ignited fires have burned thousands of acres of various vegetation types. The overall effect of this past policy and its continuation has been and would be to reduce burned acreage over the short-term. Over the long-term the accumulation of fuels from increasingly dense stands of sagebrush and limber pine could result in greater intensity. Fire frequency may decrease but fire intensity may increase in some vegetation types. Regeneration of the pre-fire plant communities following higher intensity fires could be slowed by damage to roots, soil microorganisms, and dormant seeds in the soil. Limber pine, Douglas fir and quaking aspen could expand into existing sagebrush areas, although aspen stands could also decline in the absence of fire, possibly replaced by fir.

4.12 Wildlife

Wildland fires impact wildlife both positively and negatively through changes in the availability of food and cover. The extent of these changes is dependent upon the same type of factors influencing fires effects on vegetation. Direct effects of fire, while they do occur, are usually of short duration. Since wildland fires occur as a result of random events it is not possible to predict the specific effects on individual species. However, native plants and animals both have coexisted with wildland fires in the Craters of the Moon area for thousands of years.

Sensitive Species

The northern sagebrush lizard is an uncommon resident the monument. The closely related western fence lizard has been found to have a high survival rate in fires by remaining in burrows (Kahn 1960). Sagebrush lizards would likely have similar high survival due to similar habits of burrowing. Sagebrush lizards feed heavily on ants which would have a high survival rates in even the hottest fires due the depth of ant mounds in this area (Paul Blom pers. comm.). It is unlikely that a range fire would have a long term effect on this species if sage is not replaced with annual grasses

Pygmy rabbits are common throughout most of the shrubsteppe and cinder garden areas of the monument. This species may incur a high mortality rate during a range fire (Gates et. al. 1984, USFS 1998). The recovery of pygmy rabbit populations is closely tied to the recolonization of a burn by sagebrush (USFS 1998). Burns which leave a mosaic of brush may have little long term effect on rabbits. Conversely, intense fires that remove large areas of sagebrush may have adverse affects on short term populations (USFS 1998).

Three hawks which nest on the monument are listed as sensitive by the BLM. The Swainson's, ferruginous hawks, and the northern harrier are most at risk from fires at the nest site. This is only an issue for fires during the spring nesting period. Once young fledge most of these hawks will benefit from the increase in rodent populations in the first couple years following most range fires (Howard and Wolfe 1976). Harriers are ground nesters and the other 2 hawks will prefer to nest in isolated trees or on the ground. It is unlikely fire would have any affect on nesting since most fires will leave at least a few suitable trees within the defended home range of any one pair.

Loggerhead shrikes are uncommon nesters on the monument. Loggerhead shrikes would likely benefit from a fire which produces a mosaic of habitat and like the hawks will benefit from an increase in prey species. Shrikes prefer areas with medium to tall grasses with adjacent shrub cover for nesting (Yosef 1996). Shrikes also need at least a few mature shrubs for use as hunting perches.

A number of warblers and flycatchers nest in the monument. Most of these species should not be affected long term by fire. A major stand replacing fire on the north end would have a temporary effect on the availability of nest sites. Most of the species that nest here are shrub nesters which will return as riparian shrubs return. One sensitive flycatcher in the Monument which is not riparian is the Gray Flycatcher. This flycatcher nests in shrubs of varying species (USGS 1998). A fire that leaves a mosaic of unburned shrubs should not have a long term effect on these birds.

Brewer's and sage sparrows are both common nesters on the monument. Both of these sparrows need shrubs for nesting but frequently nest in shrubs such as bitterbrush and rabbitbrush which will grow from the root following a fire. An intensive fire that killed a high percentage of shrubs could potentially cause a short term decline in the availability of breeding territories. Long term effects of range fire should be negligible on these species if the site is not converted to annual grasses and shrubs are able to repopulate (Peterson and Best 1987).

Green-tailed towhees are a common sparrow on the monument during the summer months. Towhees nest in shrublands interspersed with trees particularly conifers (Ehrlich et al. 1988). This sparrow feeds on insects as well as grass seeds and berries. Given its varied diet and preferred nesting habitat this bird will likely either benefit or show little response to a moderate intensity fire that left a mix of burned and unburned vegetation .

Lewis' woodpecker and red-naped sapsucker are both woodpeckers that would see both short and long term benefit from a forest fire. For these species fire killed trees would provide nesting substrate. More

importantly, fire has a positive long term advantage since both of these woodpeckers prefer to excavate softer substrates such as aspen. Fire is an important process in the rejuvenation of stagnate aspen stands. Lewis' woodpecker also uses abandoned holes made by the hairy woodpecker and northern flicker. A large hot stand replacing fire could provide a large increase in usable nest sites in the short term but might available in later years. A fire on the north end would have the added benefit of stimulating growth of aspen which is a more suitable nesting substrate for both of these species.

Long-eared myotis roost in crevasses and under loose bark of trees. In the near term, a fire in a forested stand has the potential to suffocate sleeping bats. However, as with the situation with woodpeckers, a fire has the potential to increase roosting habitat in the short term. The major long term effect will be the lack of snag recruitment for decades following a large hot stand replacing fire. It is not likely any other bat species will be impacted by wildfire since the majority of bat species on the monument are cave roosters and wildfire is unlikely to have any effect on those species.

Sage grouse may or may not be influenced by wildfire. During the breeding season sage grouse need a mosaic of habitat with open grassy areas adjacent to mature sagebrush (USFS 1998). A fire which creates this type of mosaic burn can improve habitat for grouse. Small burns in large tracts of dense sage can even create new lek sites. Elsewhere on the Snake River Plain sage grouse neither preferred nor avoided burned areas (Martin 1990).

On wintering grounds sage grouse are much more dependent on large expansive tracts of mature sage that is large enough to be accessible in the local snow cover. The Idaho department of Fish and Game recommends complete fire suppression be undertaken on winter range (IDFG 1997). This should not be a important issue on the monument because there only 2 records of sage grouse during December. All other records for sage grouse are during the period between mid May and mid August. The monument also gets a deeper snow pack than much of the surrounding region and most of the forage is inaccessible to grouse. It is unlikely that many grouse winter in the monument.

The distribution of sage grouse observations in the monument suggest that grouse use the monument during brood rearing and migration. This is the period in their annual cycle when the species is the most flexible and would likely benefit the most from a fire created mosaic of habitat (USFS 1998). As with many other species a negative response to wildfire in the monument will largely be influenced by the level of invasion by exotic annual grasses following a fire and whether native shrubs are able to recover.

Large Herbivores

Large herbivores include pronghorn, mule deer, and elk. These species will increase use of an area following wildfire (USFS 1998). Pronghorn and elk are grazers which benefit from improved forage conditions following fire (Higgins et al. 1989 and USFS 1998). Most grasses return quickly following a fire and elk and pronghorn will show increased use of burns for several years following the fire (Deming 1963). Young bitterbrush foliage is more nutritious than older leaves (USFS 1998) and the new growth following a fire will also benefit these species.

Mule deer will increase use of a burned site particularly if a mosaic is left with scattered or islands of shrubs left alive. If old sagebrush is crowding bitterbrush and other more palatable species deer will increase use of a burned site (Smith 1985). Long term effects on mule deer will be determined by the recovery of browse species, particularly bitterbrush (USFS 1998). Bitterbrush resprouts from the root but recovery is influenced by fire intensity, temperature, and season (Wagstaff 1980).

All three large herbivores should benefit from a fire that creates a mosaic of brush and grasses.

This mix of habitat will provide old, large shrubs for cover as well as younger vegetation and grasses for forage.

Sagebrush Obligates

Several wildlife species that occur in the monument are found only or primarily in sagebrush habitats throughout their range. Most of these were discussed above including the: sagebrush lizard, pygmy rabbit,

pronghorn, sage sparrow, brewer's sparrow, sage grouse, and loggerhead shrike. One which is not a sensitive species is the sage thrasher. Thrashers nest in the tallest shrubs available, yet they prefer open grassy areas for foraging. Like many other birds, thrashers would likely show no negative effect in numbers or survival following a moderate intensity fire that left a mosaic pattern of vegetation (Peterson and Best 1987). Thrashers would however, likely decline following a hot fire that killed most or all of the sage plants (Idaho Partners in Flight). Long term influences will be determined by sagebrush recovery and how much of a burn is converted annual grasses.

Other Species

Some passerines and small mammals have specialized habitat requirements that are less dependent on vegetative structures. Species such as rock wrens, swallows, bats, and pika are more dependent on physical structures such as rock textures and are not likely to be affected by wildfire. These species are not likely to be affected by wildfire unless it changes food supplies.

The pika forages primarily on grasses which generally increases following fire but spends most of its time in sparsely or nonvegetated lavas. It very unlikely that wildfire would have any affect on pika. Most of the other species in this general category are insectivorous and use similar areas of sparse vegetation and are not likely to be affected by fire unless there is widespread conversion to annual grasses from shrubland. Mountain Bluebirds although generally cavity nesters are in this category because most individuals in the monument occupy the lavas and are nesting in crevices rather than tree cavities.

Other species such as many passerines, rabbits, mice and lizards are less specialized in habitat requirements. Many of these species are correlated more with diversity of structure than with the species of shrub. Like many of the sensitive species the major issue with this overall group is to what degree the post fire site is overtaken by exotic and annual grasses (Nydegger et al. 1986).

Small carnivores such as coyote, fox, bobcat, badger and weasels can avoid actual fires while they are burning and should suffer very light mortality rates. Response to a fire and recovery of populations for these species will be determined more by rodent numbers than other factors (USFS 1998). The various snakes in the monument feed on rodents and rest in burrows and should follow the same pattern as mammalian carnivores.

There are three species that have endemic subspecies in the area in and around the monument. These are subspecies of the pika, great basin pocket mouse, and the yellow-pine chipmunk. The pika was addressed above. The pocket mouse greatly increases its numbers in burns for several years following a burn in shrublands (Longland 1994). Pocket mice will forage extensively on cheat grass seeds when available (Schreiber 1978) and are found in high numbers even in burns that are converted to cheat grass (Brandt and Rickard 1994). Numbers are high in sites dominated by cheat grass but survival is higher on sites that retain cover shrubs such as bitterbrush and sage (Gano and Rickard 1982). Use of burned sites is highest during spring and summer when grasses are available and numbers drop to the same as unburned sites when grasses die off in the fall (Frenzel et al. 1979).

Extirpated from the monument by the 1960s. It is unlikely that porcupines currently occur in the monument. If porcupine do return or are restored to the monument lands, this slow moving animal will likely be overtaken by a hot, fast moving fire. This species will likely experience short term population decline following a fire which kills a large number of trees. Porcupines feed on the live portions of conifers and the loss of a high percentage of trees could have a negative affect on populations of this species. A moderate intensity fire that created a mosaic of tree survival and ages would have a neutral to positive affect on the population trend. This would be a primary result of two factors. First, if porcupines are restored it will take a number of years to build up a large enough population that survivors would not be able to simply move to adjacent unoccupied habitat in the event of tree killing fire. Second, forest fire stimulates growth in many trees that survive or germinate in the years following the fire.

Sensitive Species at Craters of the Moon National Monument

	ID	BLM

REPTILES		
Northern Sagebrush Lizard	X	
MAMMALS		
Townsend's Big-eared Bat	X	
Western Small-footed Myotis		X
Long-eared Myotis		X
Fringed Myotis	X	
Pygmy Rabbit	X	
BIRDS		
Bald Eagle	Federal and state threatened	
Northern Goshawk	X	
Ferruginous Hawk		X
Swainson's Hawk		X
Northern Harrier		X
Peregrine Falcon	Federal* and state endangered	
Prairie Falcon		X
Merlin		X
Sage Grouse		X
Burrowing Owl	X	
Lewis' Woodpecker		X
Red-naped Sapsucker		X
Williamson's Sapsucker		X
Rufous Hummingbird		X
Loggerhead Shrike	X	
Gray Flycatcher		X
Dusky Flycatcher		X
Hammond's Flycatcher		X
Cordilleran Flycatcher		X
Yellow Warbler		X
MacGillivray's Warbler		X
Townsend's Warbler		X
Wilson's Warbler		X
Plumbeous Vireo		X
Swainson's Thrush		X
Green-tailed Towhee		X
Brewer's Sparrow		X
Sage Sparrow		X

ID = Idaho Department of Fish and Game
BLM = U.S. Department of Interior, Bureau of Land Management

*** = Currently Considered for delisting**

4.13 Air Quality

Under this alternative air quality would be impacted by wildland fires burning adjacent to the Monument or by wildland fires burning within the Monument before they are suppressed. These are the conditions that the Monument currently experiences. The level of impact would be dependent upon the incident rate, location, size and time needed for suppression of any fires that would occur in a given fire season.

4.14 Wilderness Values

The Wilderness Act (Section 4(d)(1) does permit measures to control wildland fires subject to conditions set by the Secretary of the Interior. However, continued suppression of all wildland fires in the Craters of the Moon Wilderness Area would create unnatural conditions which are contrary to the provisions of the Wilderness Act (16 U.S.C. 1131-1136, Section 2). Wildland fires are a natural process which influenced the distribution of plants and animals within the wilderness for thousands of years prior to the current fire suppression era. The Wilderness Act defines wilderness as an area "managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature…". Fire suppression would thwart one of nature's forces and as result create unnatural conditions.

Fire suppression operations using aircraft dropping fire retardant or large crews of firefighters would create both noise and ground disturbance from fire lines or camps with both short and long-term effects on natural conditions and recreational opportunities for solitude.

4.15 Cultural Resources

Under current conditions, the primary impacts would be the discovery and/or disturbance of previously undocumented archeological sites and artifacts through suppression activities that would cause ground disturbance. If such a event occurred, an archeologist would be detailed to the Monument to evaluate the situation. Suppression activities would avoid all documented cultural resource sites when controlling a fire.

4.16 Safety

This alternative would require the NPS to take action to suppress all wildland fires throughout the monument. Each suppression operation places firefighters at risk. Risks occur both during actual fire suppression operations and during travel to and from fire locations. Fire locations within the wilderness (FMUIII) require access on foot or by helicopter. Foot travel involves the risk of falling or tripping while walking across rough terrain and heat exposure. Helicopter travel to unimproved landing sites is considered hazardous duty for firefighters.

4.20 Alternative B (Preferred Action) - Fire Management Driven by Resource Objectives

4.21 Vegetation

The preceding discussion of fire effects on the plant communities of CRMO also applies to implementation of Alternative B. Wildland fires will occur regardless of which alternative is selected. Alternative A's policy of a full suppression effort would continue to be applied to areas in Fire Management Unit I (all areas north of the highway and the headquarters complex). Fire Management

Unit I includes most of the quaking aspen communities and all of the riparian and Douglas fir communities within the monument. Since aspen stands are usually dependent upon fire to regenerate stands, both alternatives being considered could result in a decline in aspen over the long-term.

Implementation of Alternative B could, in the short-term, result in more burned acreage within Fire Management Units II and III. The extent of this increase is difficult to quantify since the number and location of wildland fire starts is unknown and the intensity and extent of spread is dependent upon the specific area ignited and weather conditions present at the time. However, past CRMO fire behavior indicates that over the long term the total acreage burned in remote areas of the monument (Fire management Unit III) would not increase compared to Alternative A. The majority of vegetated areas within Fire Management Unit III consist of light shrub and grass fuels which burn rapidly but are confined by surrounding lava flows.

Alternative B would permit fire to resume its role within Fire management Units II & III. Over the long-term fuel levels and fire intensity would decline as natural ignitions produce a mosaic of patches dominated by early successional forbs and grasses and areas dominated by varying aged sagebrush/bitterbrush stands. The spatial arrangement of this mosaic would vary over time; influenced by successional development and periodic wild fires. Overall, biological diversity would increase.

The spread of noxious and exotic weeds is most likely to be enhanced by wildland fire disturbance in those areas with weeds already present. The highest potential currently exists in areas where suppression strategies are identical in both alternatives (area adjacent to and to the north of Highway 93, 20/26). The most important exotic plant south of the highway is cheat grass (Bromus tectorum), a highly fire adapted annual grass. In many areas of the Snake River Plain cheat grass dominates areas formerly dominated by sagebrush and perennial bunch grasses following fire. While cheat grass is widespread throughout the monument it does not appear to dominate following fires such as the 2,000 acre Little Prairie fire in 1992. Areas on the Upper Snake River plain with healthy perennial bunch grasses and forbs pre-fire recover without cheat grass dominance.

4.22 Wildlife

The effects of implementation of Alternative B on wildlife largely follow the effects discussed under Alternative A and the preceding discussion on vegetation. Alternative A would likely increase the amount of area burned over the short term but over the long term fire intensity would decrease. To the extent that these wildfires would alter vegetation communities by favoring early seral stage grasses and forbs, species which benefit from early seral stages of plants would be enhanced. Species which require food or cover from older growth trees and shrubs, such as the sagebrush obiligates, would likely have a decrease in available habitat overall.

4.23 Air Quality

In the short-term, air quality could deteriorate due to a couple of factors. First a wildland fire that in the past would have been suppressed, would be permitted to burn, under specific burning parameters, creating smoke over a longer time period. Secondly, a “Wildland Fire Use” fire in an area that has not burned in long time will have heavy fuel loadings, resulting in more material to burn, which will mean more smoke will be produced. This second factor will be reduced as the natural fire cycle is resumed.

The primary area of impact will be within the Monument’s wilderness area, which is also a Class I area under the Clean Air Act. A Class I area is an area that receives the highest level of protection under the Clean Air Act; degradation of air quality in these areas by man’s activities is strictly regulated. Under the Clean Air Act, smoke from a natural caused wildland fire is not considered a man-caused activity. Smoke impacts will occur as “Wildland Fire Use” fires are allowed to burn, under specific burning parameters, instead of being suppressed. These smoke impacts could increase, as “Wildland Fire Use” fires will tend to burn more area than a wildland fire that would be suppressed.

Increased smoke will effect the visibility in the Class I area by decreasing the visual range. Visibility is an important attribute that is protected in Class I areas. Fortunately, the geography of the Monument offers many advantages that will serve to minimize smoke impacts: its high elevation and vigorous winds assure good mixing during most of the fire season. Additionally, when conditions favor a wildland fire in the Monument, it is likely that the burn here will be part of a much broader wildland fire complex to which the smoke contribution from the Monument will be marginally important.

Decision not to suppress the fire could result in a larger active fire front which would take longer to suppress following a decision to suppress based upon developing weather conditions unfavorable for smoke dispersal. Weather forecasts and availability of suppression resources will be continuously monitored during all fires. The Monument will mitigate smoke impacts by taking appropriate control actions to suppress a fire, if human health and safety are threatened or if serious visibility impairment occurs. The NPS will consult with the Idaho Department of Environmental Quality and the Southern Idaho Smoke Management Plan to determine whether smoke dispersal conditions and air quality conditions are adequate to allow fires to continue to burn.

4.24 Wilderness Values

This alternative would permit most naturally ignited fires in the wilderness to act as forces of nature in keeping with the intent of the Wilderness Act. With fire as an influence the area would be closer to its "natural conditions". Under this alternative fewer wildland fire suppression operations would take place in wilderness resulting in fewer intrusions of noise (aircraft) on recreational opportunities for solitude and less ground disturbance for fire crews and fire lines.

4.25 Cultural Resources

Under this alternative, there is the potential for fire to damage archeological artifacts that are located on the surface of the ground. Fortunately, a large portion of the area that will be designated as suitable for "Wildland Fire Use" fire has already been surveyed for cultural resources and the sites that were found have been thoroughly documented. Additionally, the nature of the artifacts documented at the Monument is primarily stone and thus is not extremely sensitive to heat.

4.26 Safety

This alternative would not require the NPS to take action to suppress all wildland fires throughout the monument. Fewer suppression operations would place firefighters at less risk. Risks would not be eliminated, even if suppression action is not taken, as fire monitoring activities will still require firefighters to access the fire site. The number of firefighters required for monitoring is less than required for suppression.

4.30 Unavoidable Adverse Effect

Short duration impairment of air quality, including elevated concentration of fine particulates and decreased visibility, will take place in the immediate vicinity of wildland fires and over larger areas during unfavorable weather conditions. The initial loss of mature sagebrush will decrease habitat for sagebrush obligate species. Both unavoidable adverse effects will occur to some degree regardless of the alternative selected.

4.40 Relationship of Short-term Uses and Long-term Productivity

Short-term impairment of air quality (1-7 days) and the localized loss of mature sagebrush steppe vegetation (20-50 years) are offset by the overall increase in biological diversity as a result of wildland fires creating a mosaic of plant communities .

4.50 Irreversible and Irretrievable Commitments of Resources

Both Alternative A & B could result in irretrievable loss of resources for a period of time. Continued fire suppression could result in the gradual decline of quaking aspen stands. Not suppressing wildland fires in Fire Management Unit III could result in the loss of mature sagebrush stands. In either case, recovery is likely to occur in some period of decades; in the first case because a wildland is likely to burn and regenerate aspen stands regardless of suppression efforts, and in the second case sagebrush would recolonize unless annual grasses dominate.

Neither alternative would result in an irreversible commitment of resources.

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